

Wide Range Neutron Detector, Phase II

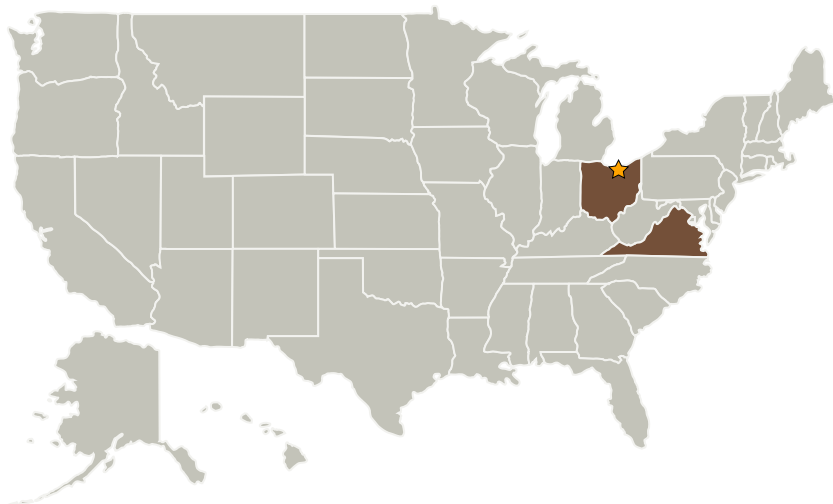
Completed Technology Project (2005 - 2007)



Project Introduction

Current design concepts for space nuclear reactors are well advanced in core configurations and architectural design. There is need however to determine how such systems will be monitored and instrumented. In the past, detection systems have been forced to employ different types of detectors for different flux levels. We propose here an adaptation of a Wide Range Neutron Detector (WRND) system, currently in use at ground-based nuclear research facilities, for its operation in the space environment. This new system, capable of measuring neutron flux and flux rate in the entire operating range of the reactor (from a neutron flux of 100 n/cm²/sec to more than 1010 n/cm²/sec), could be utilized to monitor and control a space-based nuclear power reactor. In this way, a single instrument chain can be used instead of different instrumentation for each of the reactor's operation ranges (start-up, ramping-up, and nominal power). This is a clear advantage for space applications where simplicity, reliability, and size constraints are of premium importance. A WRND would allow for a significant reduction in the complexity of space-based nuclear instrumentation and control systems. This SBIR Phase II will result in a complete detailed design for a space-based WRND, and will include fabrication and testing of a prototype system at a ground-based research reactor.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Aurora Flight Sciences Corporation	Supporting Organization	Industry	Cambridge, Massachusetts

Primary U.S. Work Locations

Ohio	Virginia
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.1 Detectors and Focal Planes